Figure 1. SCOR performance measures for a supply chain

Supply Chain Process	**Measurement Criteria**	**Performance Indicators**
Customer-facing	Supply Chain Reliability	Delivery performance
		Order fulfillment performance
		Perfect order fulfillment
	Flexibility & Responsiveness	Supply chain response time
		Production flexibility
Internal-facing	Costs	Total logistics management costs
		Value added productivity
		Return processing cost
	Assets	Cash-to-cash cycle time
		Inventory days of supply
		Asset turns

Figure 2

SES		**Service Effectiveness for Shippers**
SES – REL	1	Fulfill promises to shippers (e.g. on-time vehicle arrival; offer competitive rates) [0.59]*
	2	Solve shippers' problem (e.g. suggest best routing) [0.54]
	3	Perform services for shippers right the first time (e.g. correctly inputted B/L) [0.68]
	4	Provide services at the time promised to the shippers (e.g. on-time delivery to exhibition site; higher shipping frequency than rival companies) [0.52]
	5	Keep shippers' records accurately (e.g. correct invoice) [0.69]
SES – RES	1	Tell shippers exactly when services will be performed (e.g. location and opening hours of the depots/ container freight station (CFS)/ warehouse) [0.70]
	2	Give prompt services to shippers (e.g. special packaging for furniture/ piano etc) [0.59]
	3	Willingness to help shippers (e.g. give advice on shipping schedule or packaging; track and trace status of the cargoes shipped) [0.74]
	4	Timely response to shippers' requests (e.g. delivery/ transshipment of cargoes at short notice) [0.70]
OE		**Operations Efficiency for Transport Logistics Service Providers**
OE – COST	1	Reduce order management costs (e.g. minimize order handling through EDI) [0.75]
	2	Reduce costs associated with facilities/ equipment/ manpower used in providing the services (e.g. use IT to track and trace the status of shipped cargoes) [0.85]
	3	Reduce warehousing costs [0.74]
	4	Reduce transportation costs [0.75]
	5	Reduce logistics administration costs (e.g. build good relationships with related organizations such as customs, bureau of commodity inspection, port authority) [0.68]
OE – ASST	1	Improve the rate of utilization of facilities/ equipment/ manpower in providing the services [0.71]
	2	Improve the cash to cash cycle time (the average days required to turn a dollar investment in facilities/equipment/manpower providing the shipping services into a dollar collected from customers) [0.82]
	3	Improve net asset turns (working capital) [0.77]
SEC		**Service Effectiveness for Consignees**
SEC – REL	1	Fulfill promises to consignees (e.g. advise arrival schedules; complaint handling) [0.64]
	2	Solve consignees' problems (e.g. provide warehousing; repackage cargoes

at CFS) [0.81]

3 Perform services for consignees right the first time (e.g. pack and remix cargoes) [0.79]
4 Provide services at the time promised to the consignees (e.g. availability of cargoes for collection at CFS) [0.80]
5 Keep consignees' records accurately (e.g. error-free records of consignees' addresses and opening hours) [0.70]

SEC – RES 1 Tell consignees exactly when services will be performed (e.g. advise estimated time of arrival (ETA) via fax/ mail; advise estimated time to change B/L to D/O) [0.75]
2 Give prompt services to consignees (e.g. advise regulations regarding discharge of overweight/ over-length cargoes) [0.74]
3 Willingness to help consignees (e.g. suggest inland routing) [0.77]
4 Timely response to consignees' requests (e.g. transshipment arrangement) [0.73]

* Standardized loadings in CFA

Figure 3. Summary measurement results

Factors	Number of items	Mean	S.D.	Alpha	Range of Item-total correlations
SES – REL	5	4.12 (3.80)	0.52 (0.49)	0.74 (0.73)	0.45 – 0.57 (0.36 – 0.64)
SES – RES	4	4.04 (3.92)	0.48 (0.53)	0.76 (0.77)	0.46 – 0.63 (0.45 – 0.68)
OE – COST	5	3.65 (3.69)	0.73 (0.49)	0.87 (0.70)	0.62 – 0.77 (0.42 – 0.55)
OE – ASST	3	3.74 (3.65)	0.41 (0.62)	0.80 (0.79)	0.56 – 0.72 (0.58 – 0.74)
SEC – REL	5	4.03 (3.87)	0.63 (0.42)	0.86 (0.66)	0.57 – 0.75 (0.18 – 0.52)
SEC – RES	4	4.01 (3.84)	0.52 (0.46)	0.83 (0.60)	0.61 – 0.70 (0.30 – 0.61)

Note: Entries in the parentheses are pilot test results

Figure 4. Profile of the respondent companies (n = 134)

Nature of Business	
Sea Transport	30 (22.4%)
Freight Forwarding	49 (36.6%)
Air Transport	2 (1.5%)
Third Party Logistics Services	53 (39.5%)
Number of Employees	
Below 100	102 (76.1%)
100 – 499	23 (17.2%)
500 – 999	1 (0.7%)
over 1,000	7 (5.2%)
Unknown	1 (0.7%)
Level of turnover (HK$)	
Below 1 million	17 (12.7%)
1-10 million	40 (29.9%)
10-100 million	45 (33.6%)
over 100 million	28 (20.9%)
Unknown	4 (3.0%)

Figure 5. Results from confirmatory factor analysis model for SES, OE and SEC

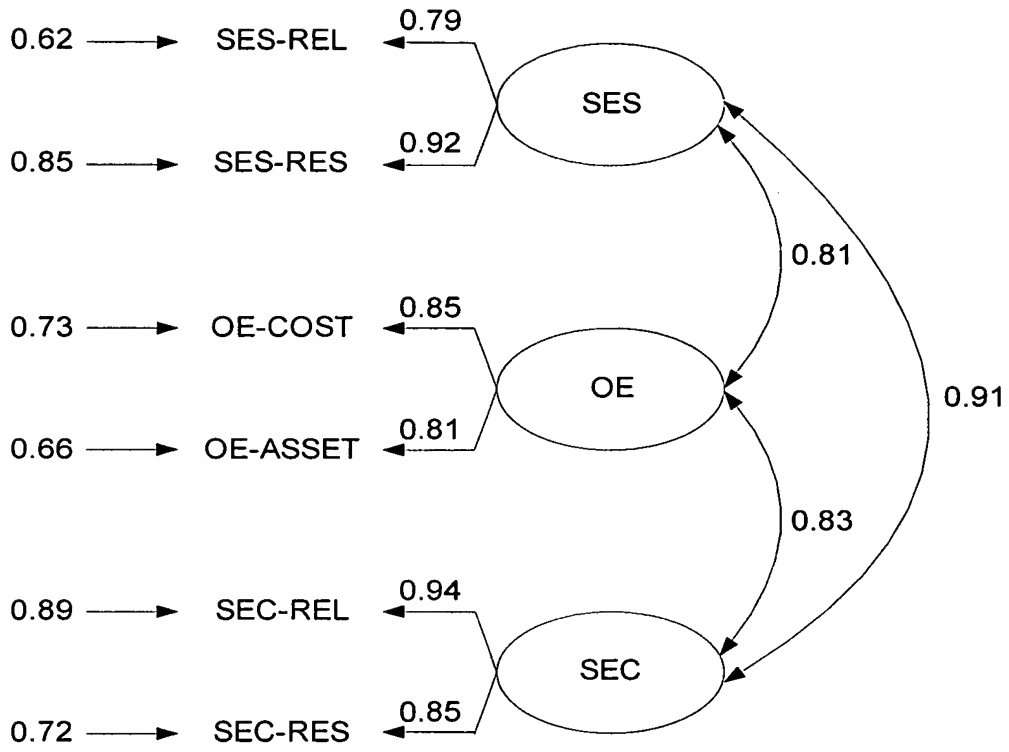
Measurement Models	Range of Standardized loadings	Range of t-values	CFI	GFI	NFI	RMR	χ^2 (d.f., prob.)
SES			0.99	0.96	0.93	0.03	27.72 (26, P > 0.10)
SES - REL	0.52 – 0.69	4.89 - 7.47					
SES - RES	0.59 – 0.74	6.11 – 7.47					
OE			0.88	0.86	0.86	0.05	85.45 (19, P < 0.01)
OE - COST	0.68 – 0.85	7.64 – 9.73					
OE - ASST	0.71 – 0.82	7.89 – 8.22					
SEC			0.95	0.91	0.92	0.03	57.29 (26, P < 0.01)
SEC - REL	0.64 – 0.81	6.91 – 7.75					
SEC - RES	0.73 – 0.77	8.25 – 8.73					

Note: For standardized loading of individual measurement items, see Appendix A

Figure 6. Discriminant validity checks: Chi-square differences

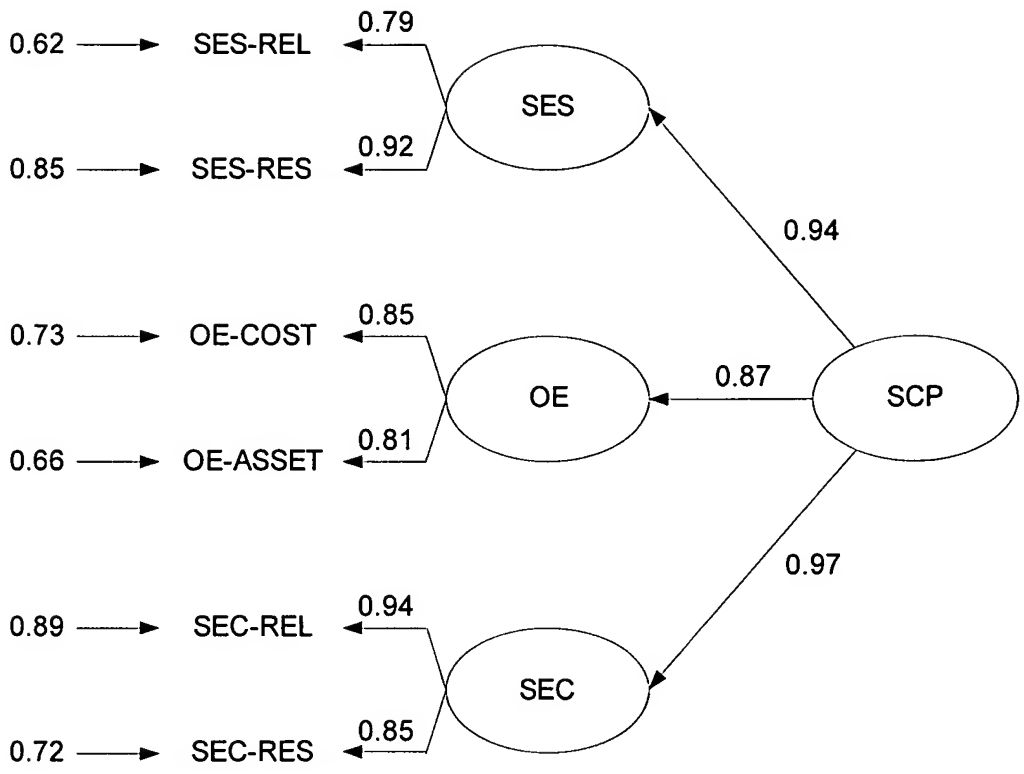
Factors	1	2	3	4	5
1. SES-REL					
2. SES-RES	1.80				
3. OE-COST	25.11	47.85			
4. OE-ASST	43.51	28.41	20.94		
5. SEC-REL	20.83	2.52	62.38	48.93	
6. SEC-RES	40.69	6.93	74.95	52.74	5.70

Note: Chi-square difference between the separate latent factors measurement model and a one latent factor measurement model (all tests = 1 *df*); $\chi^2 > 11$, $p < 0.001$; $\chi^2 > 6.7$, $p < 0.01$; $\chi^2 > 3.85$, $p < 0.05$.



Chi Square (6) = 25.08 (P < 0.001)
Goodness of Fit Index (GFI) = 0.94
Root Mean Square Residual (RMR) = 0.011
Comparative Fit Index (CFI) = 0.97
Normed Fit Index (NFI) = 0.96

Figure 7. First-order factor model of SCP in transport logistics



Chi Square (6) = 25.08 (P < 0.001)
Goodness of Fit Index (GFI) = 0.94
Root Mean Square Residual (RMR) = 0.011
Comparative Fit Index (CFI) = 0.97
Normed Fit Index (NFI) = 0.96

Figure 8. Second-order factor model of SCP in transport logistics